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STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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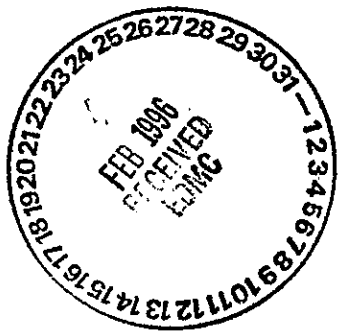
February 20, 1996



Ms. Donna Wanek
U.S. Department of Energy
P.O. Box 550, H4-83
Richland, WA 99352

Dear Ms. Wanek:

Re: Comments on Draft A of RCRA Facility Investigation Report for the 200-PO-1 Operable Unit (DOE/RL-95-100) 42712

The Washington State Department of Ecology (Ecology), has completed the review of the RCRA Facility Investigation Report (RFI) for the 200-PO-1 Operable Unit. The enclosed review comments include comments from both Ecology and the Environmental Protection Agency (EPA). The comment types are divided into three sections, general, specific, and administrative. No formal disposition response is requested for the administrative comments.

In general, the document is well written and follows the methodology identified in the Data Quality Objectives (DQO) established in 1995. However, some outstanding issues remain. The discussion of potential sources is weak and should be augmented to include CERCLA and RCRA past practice units and TSD units. Significant data are available in previous works and should be summarized in this document. Also, it is unclear in this document how much research was conducted into the groundwater RCRA monitoring data of the TSDs, since the groundwater monitoring reports were not referenced. Lastly, information is needed in the document about the proximity of groundwater contamination to water supply wells.

Since the RFI Report is a primary document, Ecology looks forward to resolving our comments within the Tri Party Agreement time frames. However, prior to comment resolution, USDOE should also include responses to previous comments concerning the DQO, which were submitted on November 28,1995.

If you have any questions or concerns, please contact me at (509) 736-5705.

Sincerely,

Suzanne Dahl, P.G.
Unit Manager
Nuclear Waste Program

SD:mf
Enclosure

cc: Paul Beaver, EPA
Administrative Record (200-PO-1 Operable Unit)

Washington State Department of Ecology's Comments on Draft A of RCRA Facility Investigation Report for the 200-PO-1 Operable Unit (DOE/RL-95-100)

General Comments:

1. There is a general lack of explanation of the various contaminant sources within the operable unit. The TSDs are discussed in some detail because of the RCRA monitoring; however, other potential contaminant sources exist within the operable unit. This type of information should be summarized in the introduction.

2. A map and discussion are needed to locate the nearest groundwater supply wells in relationship with the 200-PO-1 plumes. The document from Pacific Northwest National Laboratories (PNNL) (PNL -10886) has a figure which shows the water supply wells in the 400 Area, WPPSS, and 300 Area - this type of information should be added. Also, the location of the Richland well field should be discussed. What are the present and future impacts to water supply wells (future impacts can be discussed qualitatively in RFI and quantitatively in the Corrective Measures Study [CMS])?

3. Please reference the source for the Hanford background values. Ecology has approved the background database (that the samples taken represent background) as adequate; however, how this database is applied is up to the individual operable unit managers. In this case, please explain how the background numbers were calculated (please explain the statistics).

4. No discussion is given to the levels of contaminants in the deeper aquifers. This should be addressed and the data and discussion are available in other documents, such as the Iodine Report.

5. Appendix A (DQO) should be changed to reflect the comments made previously by Ecology and EPA (November 28, 1995).

Specific Comments:

1. Page 1-2: Add another subsection (Section: 1.5 200 East Background). This section should touch on the subjects:

- two groundwater operable units PO-1 and BP-5,
- operation history including facilities, products, waste disposal techniques, waste disposal, general volumes and significant dates,
- disposal sites of past designated as RPP, CPP, or TSD,
- present TSDs and discharge sites, and
- future disposal plans.

2. Page 1F-1, Figure 1-1: This figure, or a similar figure, should include the RCRA TSDs and provide some relationship of the RCRA units with the primary plumes. Since the ^{3}H plume defines the boundary of the operable unit, the TSDs should probably be shown in relationship with this figure and the overall operable unit boundary.

3. Page 2-2 and 2-3, Sections 2.3 and 2.4: It is unclear to what extent the annual reports from these various monitoring programs were used in the preparation of this document. This should be clarified. The annual and quarterly RCRA reports for the TSDs contain a great deal of information and they should be utilized and referenced.

4. Page 2-3: Is this list of TSDs correct? 216-A-37-1 Crib should be added, and others may be missing.

5. Page 2-3, A-AX Tank Farms, First Sentence: Does the term "decommissioned" mean nothing was being placed into the single shell tanks in this tank farm after 1980? Since they still store hazardous and radioactive waste, can they still be considered active? The term "decommissioned" should probably be defined in the context of how they are being monitored and eventually remediated.

6. Page 2-3, last paragraph: What species of uranium and plutonium? Please list numbers.

7. Page 2-4: Add a description for 216-A-37-1 Crib and any other missing TSD(s).

8. Page 3-1, Section 3.1: This section needs more information than just the remaining discharge units. Include a description of topography, runoff patterns, runoff controls, and protection of source areas from runoff events.

9. Page 3-1, 4th and 5th paragraphs: What are the present discharge rates to TEDF and B-3C? What are the future discharges rates of these facilities? When will discharge to B-3C be eliminated completely? Add more information to text.

10. Page 3-8, Section 3.3.2.1 Natural Recharge: Infiltration information from the modeling document from PNNL (PNL -10886) should be added. This document has a figure showing the recharge distribution of the site. The varying amount of recharge across 200-PO-1 operable unit should be described. For example: the 200 East Area has a significant portion described as having recharge rates of 50 to 100 mm/yr (millimeters/year) (5-10 cm/yr [centimeters/year]); the portion of 200-PO-1 to the east of the plateau has recharge rates of 10 to 20 mm/yr (1-2 cm/yr); and portions near the river are described as having recharge rates of 50 to 100 mm/yr (5-10 cm/yr). On page 3-8 and 3-9, please delete the first and last lines respectively; they are incorrect.

11. Page 3-9: What is the projected discharge rate for W049? What is the present discharge rate for 216-B-3C Pond, and what is the projected rate?

12. Page 3-12: What is the vertical gradient relationship in the remaining portion of the PO-1 operable unit to the east of 200 Area (also see Figure 3-17)?

13. Figure 3-16: This figure is not readable. Use color.

14. Page 4-1, Section 4.1: More information needs to be added to this section. All the various types of source units should be discussed as they were in the 200 East Groundwater AAMSR.

The discussion should begin with referencing Table 4-1, which lists all the waste sites (add NRDWL). The discussion should also include designating which sources are RPP, CPP, TSD, and dates of operation.

15. Page 4-1, Section 4.2: Cite evidence or references for the recharge not resulting in significant mobilization of contamination.

16. Page 4-2, Section 4.2: More discussion is needed in this section (not just referenced in tables). The discussion should include how many sources could potentially impact groundwater, how many sources could significantly contribute to groundwater (list in text). Also, the gamma logging referenced in the 200 East Groundwater AAMSR should be discussed. What does the RCRA monitoring for each TSD indicate as to past, and present groundwater contamination? What is the status of monitoring at each of these TSDs?

17. Page 4-2, Section 4.2: What does the last sentence in the first paragraph refer to?

18. Page 4-2, Second Bullet: Historical detections (which are currently below levels of concern) are still important data, because these situations may indicate areas where contamination has moved past wells and has not yet reached others wells. Please examine this situation to see if it is currently accounted for in the data screening. If it is not accounted for by the past methodology, please incorporate.

19. Page 4-3, Second Paragraph: What is the source and reference for the site background levels? Include a small description of size of data set and the methodology used in determining the background levels.

20. Page 4-3, and Page 4-4: For the wells listed as containing arsenic, please list locations and probable association with TSD(s) or other source units.

21. Page 4-4, Eighth Paragraph: The first sentence is incorrect. Three of the wells are located near Cribs 216-A-37-1 and 2. It is possible these cribs contributed to the arsenic in the groundwater. Other wells are located near other TSD(s) or source units and may be related to arsenic concentrations. Please elaborate.

22. Page 4-4, Ninth Paragraph: What do the RCRA monitoring reports indicate for the various TSD(s)? Please reference their conclusions and impacts. This data should be used more throughout this section and referenced.

The arsenic levels are not consistent throughout the 200 East Area or the 200-PO-1 operable unit area. If this were true, why would only a few wells be listed here? In fact, some wells (the ones listed in the report) show higher concentrations than the majority of others. The other surrounding wells (not listed in the report) represent background. How many wells are sampled for arsenic? Is there any evidence for bimodal distribution indicating both a background level and a contaminant level? Statistics should be performed on these arsenic concentrations.

Other potential explanations for the elevated but relatively static levels of arsenic within the 200 East Area are:

- past arsenic influx which has now moved on,
- past arsenic influx which has now dispersed to a residual contamination level, which is controlled by groundwater geochemistry, and
- a slow influx of arsenic contamination from vadose sources which keeps the arsenic levels elevated and this addition of arsenic from the vadose sources could equal to the arsenic dispersion.

Also, well 299-E25-30P shows a significant decrease - clearly not related to background. It is possible an elevated concentration of arsenic (due to contamination) existed here and has moved on and is either between wells at the present time, or has dispersed to a residual levels above background and above MTCA. Please address in text.

Remove the sentence referring to "statistically elevated above background," because no statistics were performed; but should be performed.

23. Page 4-4, Tenth Paragraph: Please clarify which chromium is discussed. How many wells were sampled for chromium in the operable unit?

Please list the MCL and MTCA standards in the text for all contaminants discussed.

24. Page 4-5, Second Paragraph: Information from the Iodine Report should be summarized here and the document referenced properly.

How many wells within the operable unit were sampled for iodine and how many show detections, how many above MCL? Specify iodine's half-life.

There is a discussion here and in several other places about proposed MCLs. How close are these "proposed" standards to being accepted or promulgated? Will 21 pCi/l be a standard used consistently by everybody or is it just a draft standard that needs to be discussed by the scientific community?

25. Page 4-5, Third Paragraph: Explain the reference to an early phase of operation in 200 East and later operation. When were these operations and what was the operation and what was the iodine contamination result? What is the evidence that a previous iodine plume has already reached the river?

Explain that the iodine will be modeled in the CMS.

The Iodine Report discusses sources within the 200 East Area - this information should be added and discussed here.

What does the RCRA monitoring indicate about iodine and potential source units? Reference documents.

What wells have the highest iodine concentrations, where are they located, and what are the values? With what source units are they associated? A few trend plots would be a good idea for these high concentration wells. The trend plots would show trends.

26. Page 4-5, Fourth Paragraph: How many wells were sampled for manganese within the operable unit? What is the MCL and how does it relate to each well listed?

27. Page 4-5 and 4-6, Listed Wells: For each well listed, state the location in relationship to source units.

28. Page 4-5, Well 40-40B: The contamination in this well is definitely related to the B-3C Pond. Is the decrease in concentration related to the decrease in discharge to the system, or related to dispersion or the plume moving past the well?

29. Page 4-6, Other wells: Relate each well to the source of contamination and offer explanations to changes in concentrations for each well.

30. Well 42-39B: Address the high initial concentration in this well. Is it possible this high level has moved in between wells and exist as a high portion of the plume?

31. Page 4-6, Fourth Paragraph: What does the RCRA monitoring reports indicate for this plume? Reference documentation.

Please add to text ". . . and not common to the **remainder** of the 200-PO-1 Operable Unit."

A plume map should be developed.

32. Page 4-6, Section 4.4.5: How many wells within the operable unit were sampled for strontium-90?

There is a discussion here and in several other places about proposed MCLs. How close are these "proposed" standards to being accepted or promulgated? Will 42 pCi/l be a standard used consistently by everybody or is it just a draft standard that needs to be discussed by the scientific community?

This plume does not show up on the plume map, please modify.

What is the increase in well 299-E17-15 related to? This is significant issue. Is it related to a continuing vadose source or leading edge of a plume?

Please add to text ". . . and not common to the **remainder** of the 200-PO-1 Operable Unit."

33. Page 4-6, Section 4.4.6: How many wells within the operable unit were sampled for tritium and how many were above the MCL? What is the area of the plume above MCL?

A more detailed description of the tritium contamination is needed.

- What were the major source units for the tritium contamination?
- The size of the plume above MCL should be indicated. Square miles.
- Where and what are the highest concentrations?
- Mobility discussion.
- Trend plots should be developed for the highest areas on the plateau for a few wells.
- Reference the tritium document and 200 East Area AAMSR.
- A detail description of the various 200,000 + plumes should be described and include:
    - high area at river - result of discharges in 19__ from __ facilities, and what are the highest concentrations;
    - high area east of 200 East - result of discharges in 19__ from __ facilities, and what are the highest concentrations;
    - high area beneath the plateau - result of discharges in 19__ from __ facilities, and what are the highest concentrations; and
    - high area beneath B pond - result of discharges in 19__ from __ facilities and what are the highest concentrations.

When addressing the areas of higher concentration list the contoured concentration. Also, list the MCL in the text.

Some trend analysis should be performed in some of the wells located in the plateau to look for continuing sources from the vadose zone.

Explain that modeling will be done in the CMS.

What does the RCRA monitoring reports indicate about tritium and the source units?

34. Page 4-7, Section 4.4.7: How many wells within the operable unit were sampled for vanadium?

35. Page 4-7, Section 4.4.8: Within the operable unit, how many wells are sampled for nitrate? How many were above MCL?

You need to be careful when discussing nitrate at Hanford and comparing to standards such as MTCA Method B and C levels and MCLs based on NO_3-N. I believe your plumes are based on NO_3 analyzed as nitrate ion, which means the standard or MCL for nitrate ion is 45 ppm. The standards for Method B and C are most likely based on NO_3 as nitrogen and the MCL is 10 ppm, which is what you have included in your tables, such as Table 4-4. You need to discuss the differences and discrepancies for what appears in the plume map and what is listed in the tables.

More information on the mobility is needed. More description of nitrate contamination is needed, not just restricted to concentrations above MCL.

More discussion on sources of the nitrate is needed. What does the RCRA monitoring indicate about nitrate contamination from TSD?

36. Figure 4-9: Please put a smaller contour interval on this plume map. Recommend using 0.5, 1, 5, and 10.

37. Figure 4-12: A more detailed iodine plume map is in The Hanford Sitewide Groundwater Remediation Strategy. Please replace this figure. The contour interval should be 1, 5, and 10.

38. Figure 4-19: This map should show wells 299-E12-14 and E12-15.

39. Figures 4-23 and 4-24: As with the tables and the text, it should be clearly defined what nitrate we are talking about. The regulatory standards should match the type of measurement of nitrate. Also, the contour interval should be smaller than the regulatory standard (45 ppm or 10 ppm). Figure 4-24 is unreadable.

40. Table 4-1: Add NDRWL and any other missing source waste sites. Which sites are TSD, RPP, or CPP?

41. Table 4-2: Show shading as referenced in the footnote. Reference this table and explain what criteria this table was based on. Also, explain that other sites not designated as potential have been shown by other means to be groundwater contaminators. Add A-AX and 2101-M Pond.

42. Pages 4T-4a and 4T-4b, Table 4-4: The values for nitrate as NO_3-N need to be related back to your discussion and plume map in the rest of the Section 4, as well as elsewhere in the document.

Is "uranium" total uranium? In other words, is it uranium-234, 235, and 238? The MCL listed in this table for "uranium" is 125 pCi/l and for ^{238}U is 97 pCi/l. However, in Table 4-5, uranium MCL screening value is 20 pCi/l.

43. Table 4-5: Cobalt 60 and Cesium 137 are listed as disposed constituents and potential contaminants of concern on Tables 4-3 and 4-4, respectively; but are not listed on the Screening Results Table 4-5. Please add.

44. Page 4T-12, Table 4-12: Is there a reason chromium is not listed in this table? It does have an Ambient Water-Quality Criteria and is a contaminant of concern.

45. Page 5-1: This Summary and Conclusion Section is inadequate. It neither summarizes nor offers conclusions. Prior to the two subsections listed in this section, a summary of the known information should be presented and some conclusions put forward. Please summarize at least the following:

- surface sources and total volumes of discharge,
- confirmed and suspected groundwater impacting sources,
- list of contaminants of concerns,
- extent of plumes (size), and

- impacts to the river and water supply wells (both present and future). Which springs and wells are presently impacted above or near MCL?

Explain why remediation of tritium is not feasible and reference appropriate documents.

In subsection 5.1 or 5.2, explain the implementation of the Sitewide permit modification and the avenues for post closure monitoring, and institutional controls.

46. Figure-1 and 5-2: These two figures are not well drafted and the location of TSDs should be shown.

47. Table A-3: MCL for Iodine is not correct. List MCL for Ruthenium 106. List MCL for Lead. List MCL for Gross Beta. List MCL for Gross Alpha.

48. Table A-3, Pages A-20-25: On this table, radionuclides are mixed in with non-rad and no units are included for the various constituents. Why are there replicate lines of various constituents, such as four nitrates, two iodine-129, etc.? Are you certain all of the nitrates listed in this table are as NO_3-N and not as NO_3-NO_3? The background and MCLs are listed as NO_3-N.

Administrative:

1. Throughout the document, references are made to other documents and the proper title, the reference, and date are not listed. Please search the document and correct this. For example: Page 1-1, Iodine Report; Page 5-1 Iodine Report, and Sitewide Groundwater Strategy Report.

2. Please be consistent in usage of unit abbreviations throughout the text.

3. Page 3-12: Figure 3-17 should not be referenced in section 3.3.3.4; rather it should be in section 3.3.3.5.

4. Figure 3-16: The color is not readable. Please modify figure.

5. Page 4-7, Section 4.4.7: The sentence beginning "Additionally. . . " is an incomplete sentence. Please change.

6. Trend Plots Figures: Please label the Y axis on each.

7. All Plume Maps: All the plume maps need to have footnotes reflecting the source years for the data.

8. Figure 4-11: The map is not needed for only one well.